

Abstract

A vertical crack is generated at a desired position on a brittle material substrate 5 by making a wheel tip 5a of a glass cutter 5 move while being in contact with the substrate surface by a load which does not allow the wheel tip 5a to damage the surface, using an armature 6 applying an abrupt impact force for generating the vertical crack having a predetermined depth, to the glass cutter 5 moving on the substrate. A scribe line is formed as the vertical crack is urged to extend along a planned scribe line, due to a stress gradient exerted onto the vertical crack and occurring between a compressive stress in an irradiation area on the substrate at which a laser beam is irradiated from a laser beam oscillator 8 and a tensile stress in a cooling area made by a cooling medium released from a cooling nozzle 7.

(150 words)